# Physical and chemical change

**1 – Physical changes.** **2 – Chemical change.**

## 1 – Physical change.

**Physical change of matter :**
**It is a change in appearance (shape) of matter without any change in its structure.**

**Examples: ice cycle/melting chocolate/grinding sugar/dissolving/malleability/cutting paper.**

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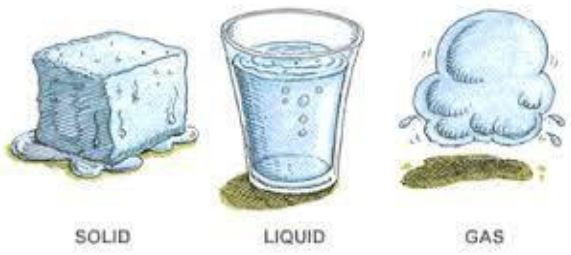
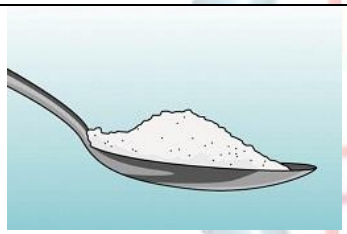
|  | |
|  | |
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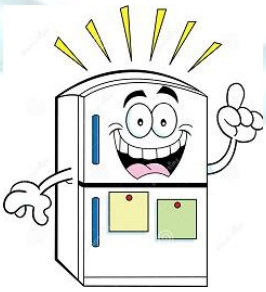
## Acitivity >>> to prove that ice cycles is a physical change.

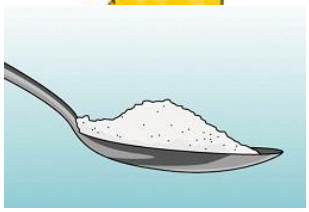
| Steps | Figures | Observation |
|---|---|---|
| **1 – put a beaker full of ice over a flame.** | | **Ice melts and changes into water.** |
| **2- continue heating the previous beaker.** | | **Water boils producing water vapour.** |
| **3 – put a cold glass sheet over the beaker.** | | **Water vapour condenses and changes into water drops again** |
| **4 – put the assembled water in freezer for some time.** |  | **Water changes into ice.** |
| **Conclusion:**<br>**Change of water from one state to another is a physical change as the shape of water changes, but its structure doesn't change.** | | |

**Activity >>>> to prove that melting of wax (candle) is a physical change.**

**Steps:**
**Fix burning candle on glass sheet or a plate.**
**Observation:**
**The wax melts and changes into liquid drops, then this liquid solidifies again.**

**Conclusion:**
**Melting of wax is a physical change as appearance changes, but structure doesn't change.**

**Activity >>>> to prove that grinding of sugar is a physical change.**

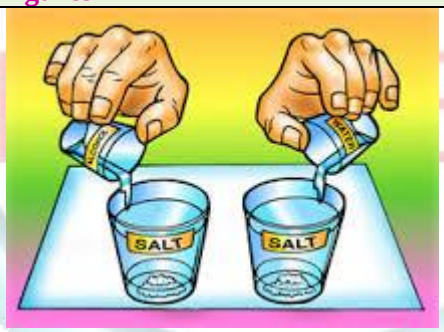


**Steps :**
**1 – take a sugar cube and taste its flavor.**
**2 – grind the sugar cube by mortar , then taste it again.**

**Observation:**
**Sugar cube changes into fine powder, but its properties (flavor) doesn't change.**

**Conclusion:**
**Grinding sugar is a physical change, as shape change, but its structure doesn't change.**

**Activity >>> to prove that dissolution of table salt in water is a physical change.**

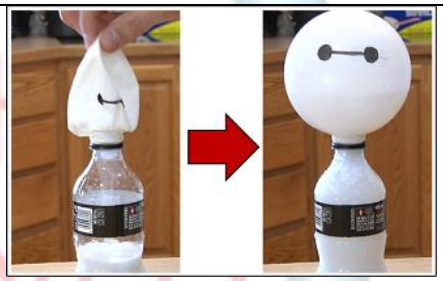
| Steps | figures | Observation |
|---|---|---|
| 1 – taste a spoon of table salt. |   | |
| 2 – add table salt to glass beaker containing water and stir it by glass rod until it dissolves. | | The shape of table salt changes |
| 3- put beaker on flame until the water evaporates. | | |
| 4 – move beaker away from the flame, then taste the remaining substance. | | Remaining substance in beaker is salt. |
| **Conclusion:** **Dissolving of table salt or sugar in water is physical changes as shape of table salt or sugar changes, but structure doesn't change.** | | |

**GR : freezing of water is a physical change?**
**Because it causes a change in shape of water , but its structure doesn't change.**

# 2 -Chemical change

**Chemical change of matter**
**It is a change in structure of matter producing new substance or new substances with different properties.**

**Examples: burning / bicarbonate / iron rusting / yeast to pastry / yoghurt/food digestion / fruit fermentation.**

| | |
|---|---|
| | |
| |  |
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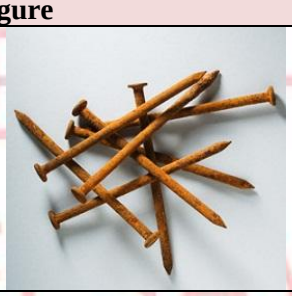
## Activity >>> to prove that burning of sugar is chemical change.

| Step | Figure | Observation |
|---|---|---|
| **Heat piece of sugar , then taste it after cooling.** | | **It form brown substance and lost its sweety taste and can't return back to sweet white sugar after cooling.** |
| **Conclusion:**<br>**Burning of sugar is a chemical change as shape and structure change by heating.** | | |

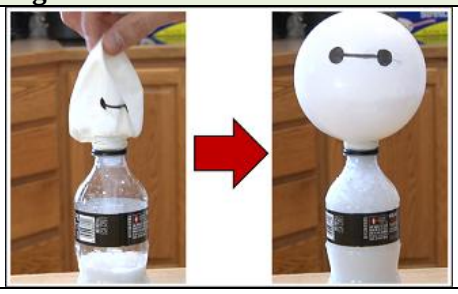
## Activity >>> to prove that combustion of paper is a chemical change.

| Steps | Figures | Observation |
|---|---|---|
| **1 – bend white paper then burn it.**<br><br>**2 – put the produced material in glass sheet, and compare between white paper and produced material.** | | **1 – white paper change into black ash.**<br><br>**2 – black ash can't be returned back to be white paper again.** |
| **Conclusion:**<br>**Combustion of paper is a chemical change as shape and structure change by burning.** | | |

## Acitivyt >>> to prove that rusting of iron is a chemical change.

| Step | Figure | Observation |
|---|---|---|
| **Expose piece of iron wire to wet air for period of time.** |  | **Formation of a brittle brown layer (rust) on iron wire.** |
| **Conclusion:**<br>**Rusting of iron is a chemical change as shape and structure change by exposed to wet air** | | |

## Activity >>>> to prove that adding sodium bicarbonate to vinegar is a chemical change.

| Steps; | Figure | Observation |
|---|---|---|
| **Put an amount of sodium bicarbonate and vingar in bottle . then put balloon quickly at the opening of the bottle.** |  | **Balloon is inflated due to production of carbon dioxide gas.** |
| **Conclusion:**<br>**Adding sodium bicarbonate to vingar is a chemical change as shape and structure change.** | | |

**G.R >>> burning of wood is a chemical change?**
**Because burning cause a change in its shape and structure of wood.**

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**Note :**
**** melting of candle is physical change, while burning of a candle is a chemical change.**

**** rusting of iron is formed due to reaction of iron and both oxygen and water.**

**Read and learn:**
**** melting of iron is physical change.**

**** addition of carbon and manganese to molten iron changes it to be harder and resists rust and corrosion (( forming alloy )).**

**** there is another alloy made of copper and gold.**

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## Exercise :

**Complete the following table :**

| Substance change. | Type of change | The reason |
|---|---|---|
| 1 – breaking of chalk | | |
| 2 –burning of wood | | |
| 3 – copper malleability into wire | | |
| 4 -Melting of iron | | |
| 5 – dissolving of sugar in water. | | |

## Comparison between physical and chemical change.

| Points | Physical change | Chemical change. |
|---|---|---|
| 1 – change in appearance | Takes place | Takes place |
| 2 – change in structure | Doesn't take place | Takes place |
| 3 – Examples | Melting of ice, and wax. Evaporation of water. | Burning of sugar , candle, and rusting o iron. |

## Vocabulary:

| | | | |
|---|---|---|---|
| **Physical change** | تغير فيزيائي | **Freezes** | يتجمد |
| **Ice cycle** | دورة الثلج | **Recycling** | اعادة التدوير |
| **Grinding** | طحن | **Chemical change** | تغير كميائى |
| **Appearance** | الشكل الظاهري | **Chalk** | طباشير |
| **Taste** | طعم | **Dissolving** | ذوبان |
| **Solidify** | يتجمد | **Flavor** | مذاق |
| **Remove** | يزيل | **Disappear** | يختفي |
| **Rod** | قضيب | **Stir** | يقلب |
| **Yeast** | خميره | **Burning** | احتراق |
| **Rusting of iron** | صدأ الحديد | **Digestion of food** | هضم الطعام |
| **Fermentation** | التخمر | **Pastry** | المعجنات |
| **Charring** | احتراق | **Yoghurt** | زبادي |
| **Black ash** | رماد اسود | **Sweety** | حلو المذاق |
| **Bend** | يثنى | **Original form** | الشكل الاصلى |
| **Wet air** | الهواء الرطب | **Iron wire** | سلك من الحديد |
| **Brittle** | هش | **Inflated** | ينتفخ |
| **Candle burning** | احتراق الشمع | **Convex lens** | عدسه محدبه |
| **Iron alloy** | سبيكة الحديد | **Molten iron** | الحديد الذائب |

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## Questions on lesson:

### Complete the following statements:

**1 – melting of ice is considered a …….. change.**

**2 – the ……. Change is a change in shape only of matter.**

**3 – ice turns into water by …….. , this process is considered as a ……. Change.**

**4 – the chemical change is change in the …….**

**5 – burning of wood is considered a ……. Change.**

**6 – freezing of molten wax drops is considered a …… change, while buring a piece of paper is a …….. change.**

**7 – adding sodium bicarbonate to vinegar is a …… change.**

**8 – charring bread is a ……. Change.**

**9 – ductility of copper into wires is considered a …….. change.**

**10 – iron rusting is considered a …….. change.**

**11 – fermentation of fruits which occurs when they are exposed to air for long time is a ……. Change.**

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**12 – adding yeast in baking is considered a …….. change.**

**14 – production of yoghurt from milk and digestion of food are …….. change.**

## Choose the correct answer:

**1 – all of these examples belong to physical changes except …….**
**A: grinding of sugar b. melting of ice3**
**c. fermentation of food. D. condensation of water vapour.**

**2 – types of changes that may occur to matter are ……. Types.**
**A:two b. three c. four d. five.**

**3 - ……. Is an example of physical change.**
**A: dissolving of sugar in water b. fermentation of fruits.**
**c. combustion of candle d. rusting of iron.**

**4 – adding table salt to water with stirring produces ……..**
**A: new substance b. chemical change. C. physical change. D. a and b**

**5 - …… is a change in appearance of matter without any change in its structure.**
**A: chemical change b. physical change. C. matter d. metal**

**6 - …… belongs to chemical changes.**
**A: burning of a candle. B. ice melting c. glass re-shaping d. water freezing.**

**7 – all of the following are chemical change except ……**
**A: burning of coal. B. formation of table salt solution c. combustion of paper.**
**d. rusting of iron.**

**8 – burning of sugar is a ……. Change.**
**A: physical b. biological c. chemical d. freezing**

**9 – adding yeast in baking is considered …….**
**A: physical change. B. chemical change.**
**c. change in its appearance only d. all the prevouis answers.**

**10 – which of the following is considered a chemical change that happens to a piece of paper?**
**A: bending it b. burning it c. cutting it d. colouring it.**

## Write scientific term:

**1 – a change occurs when a piece of sugar is burned. …….**

**2 – change that occurs when water changes into water vapour. ……**

**3 – change occurs when we produce yoghurt from milk. ……**

**4 – change occurs when iron reacts with oxygen and water. …….**

## Give reasons:

**1 – melting of wax is a physical change?**

……
……..

**2 – burning of paper is a chemical change?**

……
……

**3 – fermentation of milk is a chemical change?**

……
……

**4 – formation of clouds and rains is a physical change?**

……
……

**5 – sugar keeps its flavor after dissolving it in water ?**

……
……

## Compare between:

**1 – burning of candle and melting of wax?**

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……
……
……..

**2 – dissolving of sugar and combustion of sugar?**

……
……
……
……..

## Put (√) or (×) for the following:

**1 – burning of wood is physical change.** **( )**

**2 – rusting of iron is chemical change.** **( )**

**3- cutting paper into small pieces is chemical change.** **( )**

**4 – burning of paper is chemical change.** **( )**

*My best wishes, Ibrahim Elsayed*

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اضغط subscribe

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